

TAXONOMIC NOTES ON SOME COLLETID BEES OF
WESTERN NORTH AMERICA WITH DESCRIPTIONS OF
NEW SPECIES (HYMENOPTERA: COLLETIDAE)¹

By ROY R. SNELLING²

ABSTRACT. The following new species are described: *Caupolicana specca* (Baja California), *Colletes platycnema* (Arizona) and *Hylaeus* (*Paraprosopis*) *alocaspides* (Baja California). Based on type material comparisons, *Prosopis rugosulus* Ckll. and *P. r. fallax* Ckll. are transferred to the synonymy of *Hylaeus modestus citrinifrons* (Ckll.); the species which I treated as *H. rugosulus* (a misspelling of *rugosulus*!) in 1966 becomes *H. episcopalis*. The species long known as *H. aztecus* (Cress.) is not that species; it is *H. panamensis* Mich. The Nearctic *H. stевensі* Crwfd. is synonymized with the European *H. bisinuatus* Foerst.; the species is presumed introduced into North America.

INTRODUCTION

The present paper validates a few changes in North American *Hylaeus* in order that these may be incorporated into the forthcoming revised Hymenoptera catalog. The opportunity is taken also to describe three unusual new colletids, one from Arizona and two from Lower California.

DIPHAGLOSSINAE

The diphaglossine genera were reviewed by Michener (1966) who provided a synopsis of the North American species of *Caupolicana*. The following new species is described in order to call attention to the presence of *Caupolicana* in Lower California, an area not previously known to possess any diphaglossine bees. The description which follows is patterned after those of Michener (1966) to facilitate comparison.

Caupolicana (*Caupolicana*) *specca* new species

Figures 1-4

DIAGNOSIS. *Male:* Metasomal integument and legs dark brownish to black; metasomal terga 2 and 4 with minute pubescent patches laterally on apical margin; lateral extremities of terga 2-4 without specialized hair patches. *Female:* Unknown.

DESCRIPTION. *Male:* Length, 17 - 18 mm; forewing 13 - 13.5 mm.

1. Inner orbits converging above. Eyes closest on line tangent to posterior margins of posterior ocelli, latter far anterior to posterior margins of eyes; ocellar diameters about equal to maximum scape diameter. Ocellocular distance about three-fifths ocellar diameter. 2. Labrum basally with a pair of longitudinal ridges and weak lateral wrinkles. 3. First flagellar segment about 1.4 x length of scape. 4.

¹REVIEW COMMITTEE FOR THIS CONTRIBUTION

Charles L. Hogue
Robbin W. Thorp
Thomas J. Zavortink

²Section of Entomology, Natural History Museum of Los Angeles County.

Anterior femur much broadened posteriorly, as seen from above, a little more than twice longer than broad; middle and hind femora progressively more slender. 5. Anterior femur with dense long hairs on lower surface, especially near posterobasal angle; mid and hind femora with sparser, shorter hairs, including distinct patch (about one-fifth as long as femur) of rufescent hairs at base of mid femur. 6. Hind basitarsus wider on apical third than basal third, basitarsus a little more than half as long as slender, distinctly curved tibia. 7. Propodeal triangle without transverse ridges. 8. Posterior margin of sternum 2 broadly, shallowly, sinuately emarginate; sterna 3 and 4 more narrowly, shallowly emarginate. 9. Apex of sternum 6 rounded. 10. Hidden sterna and genitalia as in Figs. 1-4. 11. Integument black, legs brownish black, underside of scape brown, tegulae light ferruginous. Wings light brownish, veins and stigma dark brown. 12. Pubescence of head pale yellowish, with scattered fuscous hairs, especially on vertex; pubescence of thorax, legs, and tergum I ochreous, paler on venter, coxae, trochanters and femora; dorsa of terga 3-7 with hair black, progressively denser and longer caudad; tergum 2 with a pair of minute patches of white hair laterally on apical margin; tergum 4 with a similar, but larger pair of spots; sterna 1-4 with long white hair, remaining sterna with blackish hair.

TYPE MATERIAL. Holotype and one paratype male: 3 mi SW San Antonio, Terr. Sur Baja Calif, MEXICO, 3 Oct 1972 (E. M. and J. L. Fisher), both specimens in LACM.

DISCUSSION. This species is morphologically most similar to *C. yarrowi*, a species which ranges from central Mexico north to Arizona, New Mexico, Texas and southern Utah (2♀♀, 3♂♂, Zion Park, 12 July 1929, collected by C. C. Searl, LACM, extend the range of this species into Utah). The males are very similar, but those of *C. specca* lack the prominent hair bands on terga 2-4 of *C. yarrowi*. The genital structures are similar, but the gonocoxites of *C. specca* are decidedly more slender (compare with fig. 13 in Michener 1966).

The two male specimens were taken in flight at blossoming plants of *Tecoma stans* in late afternoon following a brief rainstorm.

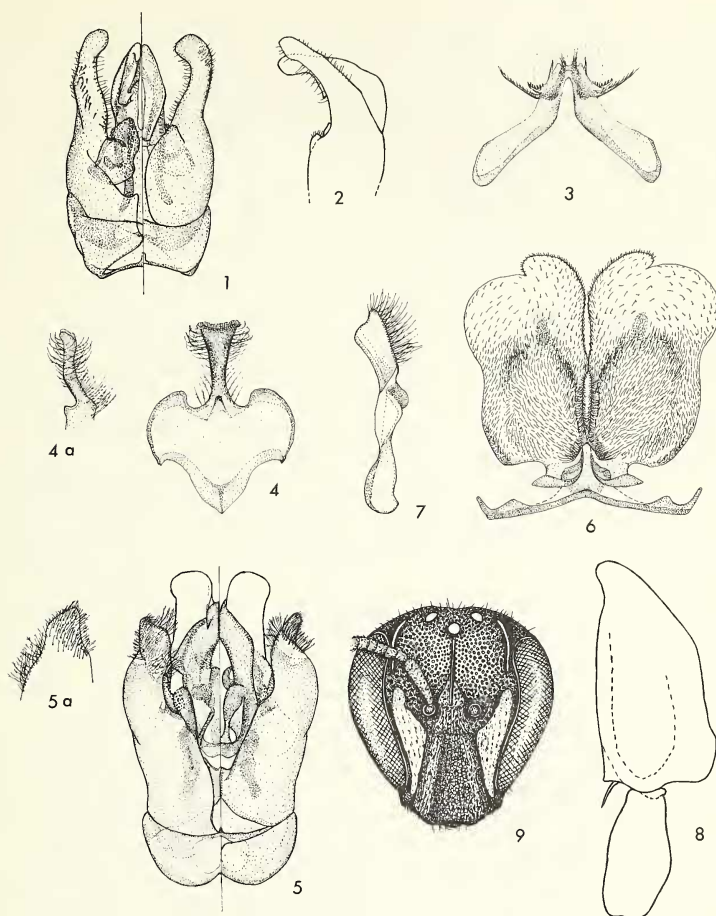
ETYMOLOGY. *Specca*, an Anglo-Saxon word meaning spotted or speckled, in reference to the minute hair spots on terga II and IV.

COLLETINAE

Colletes platycnema new species

Figures 5-8

DIAGNOSIS. *Male*: Large species, HW over 4.0 mm; hind tibia about half as broad as long, posterior margin sinuate; hind basitarsus about 2.25 x longer than broad; clypeal punctures elongate, especially toward apex, dense; clypeus not longitudinally sulcate; first tergum dull, densely, finely punctate. *Female*: HW 4.0 mm or more; clypeal punctures irregular, elongate, variably spaced; clypeus without longitudinal sulcus; prothoracic spine short, acute; first tergum densely, finely punctate; third tergum with weak basal fascia, usually hidden under margin of second segment.



FIGURES 1-4. *Caupolicana specca*, new species, male: 1, genitalia, left half ventral and right half dorsal views; 2, lateral view of apical portion of genital capsule; 3, sternum 7; 4, sternum 8, with lateral view of apical lobe (4a). FIGURES 5-8. *Colletes platynema*, new species, male: 5, genitalia, left half ventral and right half dorsal views, and profile of apex of gonostylus (5a); 6, sternum 7; 7, sternum 8, profile; 8, hind tibia and basitarsus. FIGURE 9. *Hylaeus alocaspidus*, new species, female, front of head. Figures by Ruth Ann DeNicola.

DESCRIPTION. Male. Measurements. Length, front of vertex to margin of second tergum, 12.0-13.0; forewing 11.0-12.0; HW 4.0-4.1 mm.

Head: In frontal view, 1.27-1.30 x wider than long, greatest distance between eyes slightly greater than eye length; inner orbits strongly convergent below, upper interorbital distance 1.26-1.35 x lower interorbital distance. Malar area about half as long as wide. Clypeus shiny, coarsely punctate, many punctures ovoid, especially toward apex; some interspaces, especially on either side of midline dis-

tinctly bulging, forming smooth lines; disc 1.36-1.45 x wider than long. Supraclypeal area strongly, conically raised above, but without distinct tubercule. Frons and side of face subcontiguously punctate, punctures of frons almost twice as large as those of side. Median line cariniform from summit of supraclypeal elevation to anterior ocellus. Fovea broad, impunctate, sharply defined above and along inner orbit. Vertex shiny, punctures in middle dense and about 0.6 x diameter of largest punctures of side, which are distinctly separated. Gena sharply receding from outer orbit, shiny, coarsely punctate, interspaces about 0.25-0.50 x a puncture diameter. Scape short, 2.00-2.18 x longer than wide; first flagellar segment short, 1.0-1.1 x longer than wide at apex; median flagellar segments about 0.3 x longer than broad.

Thorax: Pronotal spine short, slightly broader at base than long, apex acute. Mesoscutum shiny, contiguously punctate anteriorly, punctures equal to, to slightly larger than, those of frons in upper middle; merging to larger, subcontiguous punctures in middle of disc, becoming contiguous laterad, punctures about 1.5 x diameter those in front, small posteromedian area without coarse punctures, but with scattered minute punctures. Anterior margin of scutellum impunctate, shiny; disc coarsely, closely punctate, punctures subequal to those of scutal disc, becoming denser and finer posteriorly. Metanotum densely punctate, punctures finer and denser anteriorly. Preepisternum coarsely, subcontiguously punctate, interspaces shiny, punctures often ovoid. Disc of mesopleura slightly less coarsely punctate, interspaces slightly greater, punctures round to ovoid. Punctures similarly coarse and close on hypoepimeral area, round. Metapleural prominence weak, with a weak carina or rim which does not extend posteriorly beyond middle; prominence rugosopunctate; metapleural disc coarsely areolate along anterior margin and across middle, rugosopunctate above and below. Side of propodeum dull, densely tessellate and finely rugosopunctate; basal triangle with anterior row of coarse areolae, behind which surface is transversely rugose with about five coarse, cariniform rugae and a few finer, shorter rugae between them; areolate portion of basal triangle oblique or almost vertical, not horizontal.

Fore trochanter with blunt, triangular median projection ventrally on posterior margin; fore femur thick dorsoventrally, segment about 2.5 x longer than thick; fore tibia about 3.5 x longer than wide; hind femur flat beneath; hind tibia greatly expanded, about 2.3 x longer than wide, posterior margin somewhat sinuate (Fig. 8), outer face weakly concave in front of thickened posterior margin; hind basitarsus about twice longer than wide, posterior margin curved and slightly elevated at widest part (Fig. 8), outer face thus slightly concave; middle segments of fore and mid tarsi similar, as broad as, or broader than long, middle segments of hind tarsus slender, several times longer than broad.

Abdomen: Dorsum of first tegum densely, finely punctate, punctures much finer than those of disc of scutum, becoming finer and crowded near posterior rim; interspaces dull and tessellate on anterior half, shiny, nearly polished on posterior half. Second and third terga with punctures fine and dense in front, coarser and sparser across middle, fine and dense near posterior rim; with scattered micropunctures; interspaces shiny, smooth, about 0.25-1.00 x puncture

diameter across middle. Fourth to sixth terga dull, with dense, coarse punctures of two sizes, interspaces densely tessellate. Sterna slightly shiny, densely tessellate; second with coarse piligerous punctures across disc, posteromedially with a roughly triangular area of fine rugulae; apical margin of third sternum broadly convex behind smooth, shiny, impunctate median area, punctures very sparse across middle of segment. Fourth sternum similar but apical margin less convex. Fifth sternum with apical margin transverse; punctures absent across basal half and along midline. Sixth sternum shiny, with broad, depressed median area, flanked basally by low, broad convexities, distad of which segment is depressed and with patches of coarse setae near midline which are convergent apicad. Apical lobes of seventh sternum longer than broad, lateral margin reflexed near base, apical margin oblique and sinuate, apical portion sparsely setose (Fig. 6). Penis valve with broad membranous ventral wing; apex of gonostylus, in profile, obliquely truncate (Fig. 5).

Vestiture: Pile of face and occiput long, dense, erect on occiput; long, sparser, erect on vertex; shorter, erect on gena; tinged with ochreous on face and occiput, otherwise whitish. Pile long, erect, dense on thorax, tinged with ochreous on dorsum and on side of pronotum, otherwise whitish. First tergum on either side, terga two to five with complete apical fasciae of dense, white appressed pubescence; disc of first tergum with sparse, long, erect pile; discs of second and third terga with sparse, short, erect pile, second with a few brownish hairs laterally, third with scattered fuscous hairs; fourth to sixth terga with discal pile dark fuscous, becoming paler at sides; last tergum with dense, appressed golden-brown pile. Sterna mostly bare but with conspicuous long, sparse pile at sides of second to fifth segments, conspicuously longer on fourth segment; sixth sternum with small apicolateral cluster of long erect pile. Pile of legs slightly yellowish; fore femur with sparse, long, erect pile on posterior face and with posterior fringes on tarsi; pile scattered and short on mid and hind femora and externally on fore and mid tibia; hind tibia with fringe of long, erect hairs on anterior margin and very short, curved setae on posterior margin; outer face of hind tibia with scattered short setae; outer face of hind basitarsus with long setae anteriorly, short setae on posterior half or more.

Color: Black, mandibles dark ferruginous; flagellum dull ferruginous beneath; tegulae light ferruginous; legs dark rufescent, bases and apices of tibia lighter; hind femur and tibia mottled light and dark ferruginous. Wings brownish, veins and stigma light brown.

Female. Measurements. Length, front of vertex to margin of second tergum, 10.0-11.5; forewing 11.0-12.5; HW 4.0-4.4 mm.

Head: In frontal view, 1.27-1.32 x wider than long, greatest distance between eyes exceeding eye length; inner orbits strongly convergent below, upper interorbital distance 1.22-1.29 x lower interorbital distance. Malar area less than half as long as wide. Clypeal punctation similar to male, but with distinct shiny bosses along middle half on either side of midline; disc 1.29-1.36 x wider than long. Facial fovea deeply impressed, upper termination broad, obliquely truncate.

Scape slender, 3.8-4.1 x longer than wide; first flagellar segment about as long as broad. Punctuation similar to that of male.

Thorax: Pronotal spine as in male. Punctuation as in male. Fore coxa without apical spiniform process.

Abdomen: Punctuation much as in male but punctures finer. Sterna slightly shiny to dull, coarsely, closely punctate.

Vestiture: Pile much as in male but more ochreous, especially on cephalic and thoracic dorsa, sparser on clypeus and face; shorter on thoracic dorsum, mesoscutum with scattered fuscous or apically fuscous hairs. First five terga apically fasciate, that of first broadly interrupted in middle. Terga 2-3 with numerous short, erect, plumose hairs in pregradular area, usually hidden under margin of preceding segment. Discs of terga 2-5 with sparse, short, erect, fuscous setae; sixth with long, dense, appressed, fuscous setae. Sterna with sparse, long, erect, golden-fuscous hairs. Hairs of outer leg surface strongly ochreous tinged, on inner surfaces whitish. Wings as in male.

TYPE MATERIAL. Holotype male and allotype female: Yaqui Canyon area, 5370-5700', Huachuca Mts, Cochise Co, Arizona, 27 August 1972 (R. R. Snelling), on *Acacia angustissima*, in LACM. Paratypes: 4 ♂♂, 8 ♀♀, same locality, 27 August-1 September 1972 (R. R. Snelling), all on *Acacia angustissima*, in LACM.

The type locality is on the southwestern slopes of Coronado Peak, in the vicinity of Yaqui Spring.

DISCUSSION. The male of *platynema* is recognized easily by its large size and the broad hind tibia and basitarsus. In the key by Stephen (1954) it fails at "49" because of the relatively long malar space and densely punctate terga. The only other species in the Nearctic Region in which the male has such a broad hind basitarsus is *bulbotibialis* Stephen, described from New Mexico. That smaller species has the hind tibia bulbous, the apical lobes of the seventh sternum transverse and the clypeus elongate and sparsely, finely punctate.

The female is less obviously distinct. In the key by Stephen it goes to the vicinity of *cercidii* Timberlake, but that species is smaller (HW not exceeding 3.5 mm), with paler pubescence, finer punctuation and more weakly impressed, narrow facial foveae.

ETYMOLOGY. Gr, *platys*, wide, and *knema*, leg between knee and ankle, so named for the much broadened hind leg of the male.

HYLAEINAE

Hylaeus (Paraprosopis) alocapidus new species

Figure 9

DIAGNOSIS. *Female:* Facial length 1.4 x facial width; clypeus with broad longitudinal depression in middle; first two terga sharply, closely punctate. *Male:* Unknown.

DESCRIPTION. *Female. Measurements.* Head length 1.61-1.68; head width 1.55-1.61; forewing length 3.6-3.8; overall length, anterior ocellus to apical margin of second tergum 4.4-4.9 mm.

Black, the following pale yellow: lateral face marks, filling area between eye and clypeus, terminating acutely on eye margin at lower end of fovea; pronotal collar and spot on posterior lobe; anterior half of tegula; most of outer face of fore tibia; basal half of mid and hind tibiae on outer side. Wings faintly brownish, veins and stigma dark brown.

Head (Fig. 9): UFD 0.67-0.68 x FL; LFD 0.63-0.66 x UFD; OCD 0.74 x FW. Distance between laterobasal angle of clypeus and inner eye margin 0.69-0.71 x basal width of clypeus; distance between antennal sockets 1.50-1.58 x socket diameter; CAD 1.17-1.29 x socket diameter; distance between sockets and clypeus 1.17-1.29 x socket diameter. Clypeus about 1.25 x longer than wide, surface finely longitudinally lineolate and with sparse, fine, ovoid punctures; disc broadly, shallowly, longitudinally depressed for nearly entire length. Nonmaculate areas of face finely, subcontiguously punctate, interspaces slightly shiny. Maculate areas finely lineolate, with ovoid punctures larger than those of frons separated by less than a puncture diameter.

Thorax: Mesoscutum dull, densely punctate, punctures about equal to those of clypeus; scutellum similar but with distinct interspaces between punctures; metanotum mat, closely punctate and roughened between punctures; mesopleura dull, densely tessellate between close punctures equal to those of scutum; metapleura slightly shiny, irregularly rugulose and with scattered obscure punctures. Basal area of propodeum irregularly, coarsely areolate; transverse carina obsolescent; oblique carina absent; lateral carina obsolescent above, sides finely, closely punctate, disc finely and less closely punctate.

Abdomen: First tergum shiny, finely, sharply punctate, interspaces 0.5-1.0 x a puncture diameter on disc, becoming denser toward apical margin; second tergum duller, more finely punctate, interspaces 0.5-1.0 x a puncture diameter and with narrow, impunctate, apical, translucent band; third tergum duller, more finely, obscurely, sparsely punctate, interspaces distinctly tessellate.

TYPE MATERIAL. Holotype and one paratype: Punta Colnett, Baja California, Mexico, 23 April 1972 (A. R. Moldenke), holotype on *Eriogonum fasciculatum*, paratype on annual composite. Both specimens in LACM.

ETYMOLOGY. Gr, *alokas*, furrow, + *aspidos*, shield (clypeus).

DISCUSSION. This is apparently nearest *sonorensis* Cockerell and will come near it in my key to *Paraprosopis* (1970), since the facial length is 1.4 times the facial width in both species. The placement of the upper end of the facial fovea and the reduced propodeal carinae are also as in that species. The pronounced longitudinal depression of the clypeus is unique among known American *Paraprosopis*.

Hylaeus (Prosopis) modestus citrinifrons (Cockerell)

I examined the types of *rugosulus* and *rugosulus* var. *fallax*, both described by Cockerell (1896) from Colorado, in 1968. They proved to be, in my opinion, conspecific with the type of *citrinifrons* (Cockerell 1896) when compared with it. They are, therefore, NEW SYNONYMS of *citrinifrons*. In my paper (1966) on western *Prosopis* I used the name for a related species and misspelled it in the process. The

correct orthography, as originally published and on the type, is *rugosulus*, not *rugulosus* as I had it. The correct name for the species I called *rugulosus* is *episcopalis*.

Hylaeus (Prosopis) episcopalis (Cockerell)

The discovery that the types of *rugosulus* Cockerell and *rugosulus* var. *fallax* are synonyms of *citrinifrons* resurrects *episcopalis* as the available name for the common western species of the subgenus *Prosopis*. The subspecies which I listed in 1966 under *rugulosus* must be transferred to *episcopalis* with the following modifications:

- H. episcopalis episcopalis* (Cockerell 1896) NEW STATUS
= *Prosopis universitatis* Cockerell 1906 NEW SYNONYMY
= *Hylaeus rugulosus rugulosus* (sic!), Snelling 1966
= *Hylaeus rugulosus episcopalis*, Snelling 1966
- H. episcopalis giffardiellus* Cockerell 1925 NEW STATUS
= *Hylaeus rugulosus giffardiellus*, Snelling 1966
- H. episcopalis coquilletti* (Cockerell 1896) NEW STATUS
= *Hylaeus rugulosus coquilletti*, Snelling 1966
- H. episcopalis metzi* Snelling 1966 NEW STATUS
= *Hylaeus rugulosus metzi* Snelling 1966

The form that I regarded as nominate *rugulosus* intergrades through a continuous cline to *episcopalis* and the two should not be separated. The same will probably prove true for *giffardiellus* and *metzi*, but more material will have to be studied before this is certain. The desert form, *coquilletti*, seems more secure.

Hylaeus (Hylaeana) panamensis Michener

The type of *aztecus* Cresson has been examined. It is not a member of the subgenus *Hylaeana*, nor is it conspecific with the traditional identity established for that name by such authors as Cockerell (1924) and Snelling (1968). Cresson's species will be treated in a paper now in preparation on the Mesoamerican hylaeines. The correct name for the species previously called *aztecus* appears to be *panamensis* Michener 1954. This is the type species for the subgenus *Hylaeana*, and I can find no significant differences between Mexican specimens and the types of *panamensis*. This bee ranges from the Canal Zone, Panama, to southern Texas, Arizona, and California.

Hylaeus (Hylaeus) bisinuatus Foerster

This is a moderately abundant Palearctic species, extending from Bulgaria to France and Belgium. Snelling (1970) speculated that it might be a senior synonym of the Nearctic *stevensi* (Crawford). Too little European material was then available for a decision at that time. Through the courtesy of E. M. Barrows and C. D. Michener I have been able to study long series of both sexes of *bisinuatus*

from Czechoslovakia and Bulgaria. In my opinion, *stevensi* is a junior synonym of *bisinuatus* (NEW SYNONYMY).

Warncke (1970) lists the following as synonyms of *bisinuatus*: *discrepans* (Schenck), *incompleta* (Alfken) and *leptocephala* (Morawitz). He records *bisinuatus* from the following countries: Spain, Italy, Dalmatia, Greece, Bulgaria, Rumania, Russia, Crete, Turkey, and Caucasus. The species has also been recorded from Belgium, France, Luxemburg, Germany, Austria, and Czechoslovakia.

The bee was apparently introduced into North America sometime prior to 1910; the earliest records are from the Fargo, North Dakota, area. By about 1930, it had reached the eastern and western coasts. It now occurs in most cultivated areas of the United States.

LITERATURE CITED

- COCKERELL, T. D. A. 1896. New species of *Prosopis*. Psyche 7 (Suppl.):26-32.
- . 1924. Expedition of the California Academy of Sciences to the Gulf of California in 1921. The bees (II). Proc. Calif. Acad. Sci. (4)12:529-560.
- MICHENER, C. D. 1966. The classification of the Diphaglossinae and North American species of the genus *Caupolicana* (Hymenoptera, Colletidae). Univ. Kans. Sci. Bull. 46:717-751.
- SNELLING, R. R. 1966. Studies on North American bees of the genus *Hylaeus*. 1. Distribution of the western species of the subgenus *Prosopis*, with description of new forms (Hymenoptera: Colletidae). Contr. Sci., L. A. Co., Mus. 98:1-18.
- . 1968. Studies on North American bees of the genus *Hylaeus*. 4. The subgenera *Cephalylaeus*, *Metziella* and *Hylaeana*. (Hymenoptera: Colletidae). *Ibid.* 144:1-6
- . 1970. Studies on North American bees of the genus *Hylaeus*. 5. The subgenera *Hylaeus*, s. str. and *Paraprosopis* (Hymenoptera: Colletidae). *Ibid.* 180:1-59
- STEPHEN, W. P. 1954. A revision of the bee genus *Colletes* in America North of Mexico (Hymenoptera, Colletidae). Univ. Kans. Sci. Bull. 36:149-527.
- WARNCKE, K. 1970. Beitrag zur Systematik und Verbreitung der Bienengattung *Prosopis* F. in der Westpalaarktis (Hymenoptera, Apoidea, Colletidae.) Bull. Rech. Agron. Gembloux, n.s. 5:745-768.

Accepted for publication March 20, 1975